SITE RECORD REGION II FY:	DATES----WAM:	TDM:	DUE:

NAME: U.S. Bronze Powders EPA ID: NJD002344190 STATE ID:
EVENT TYPE: SI1 EVENT DATE: 9/29/92 LEAD: S COUNTY: Hunterdon ST: NJ
EVENT QUALIFIER: N RECOMMENDED ACTION: No further action
(PA,SI,ESI,HRS,RA,RI/FS,DEFER TO RCRA OR NRC,OTHER)
PATHWAY SCORES GW: 33.07 SW: 30.39 AIR: 1.84 SE/DC: 1.2 TOTAL: 22.48
COMMENTS:

PATHWAYS OF CONCERN:
LIKELIHOOD OF SCORING:
i.Actual/Obs. release:
ii.Targets (primary, secondary):
iii.Hazardous Waste Characteristics:
Additional information requirements:
Adequacy of information: (H=able to score, M=maybe, L=unlikely)
Notification of:
(Removal, Remedial, State, Fed. Facility, RCRA, NRC, Other)
REVIEWER: SIGNATURE COMP. DATE:
POST REVIEW EVENTS--RCRA CHECK: STATE CONCURS:

Comments:
Based on an SI Worksheet Score of 22.48, the site is recommended for no further action under CERCLA. State actions at the site should continue for the oversight of groundwater and soil ~~contamination~~ remediation.

278091

RE-REVIEWED 4/14/92 HIGH PRIORITY DS

U.S. BRONZE POWDERS
ROUTE 202 N
RARITAN TOWNSHIP, HUNTERDON COUNTY, NEW JERSEY
EPA ID NO. NJD002344190

GENERAL INFORMATION AND SITE HISTORY

U.S. Bronze Powders is a 21.9-acre site located on Block 40, Lot 4 in Raritan Township, Hunterdon County. The site is bounded by Route 202 to the north, a field and commercial properties to the west and farm fields to the south. A New Jersey Power and Light right-of-way and, beyond that, a farmhouse and fields are to the east. The nearest home is approximately 400 feet to the east. Approximately 23,300 residents are within 4 miles of the site.

U.S. Bronze has been operating at this site since 1957. The company bought the property from Marie and Clarence Alles in 1955. Prior to U.S. Bronze the site was used as a cattle pasture.

SITE OPERATIONS OF CONCERN

Until 1980 U.S. Bronze made aluminum into powder and recovered copper from large plates. The recovery process involved copper-coated solid plates being placed through a series of twelve vats. The vats contained a mixture of copper sulfate and sulfuric acid which drew off the copper. Electrical charges added to various vats also aided in removing the copper. A 3,000-gallon aboveground storage tank was used to hold waste copper sulfate solution until it was removed off site.

Currently U.S. Bronze manufactures copper and brass flakes by atomization and ball milling. In the foundry building the furnace melts the copper and copper alloys. The resulting product is then ground into powder. Twenty-three ball mills flatten the grains into flakes.

Wastes generated on site include vacuum dust which is removed from site and reused by another company. Laboratory wastes are placed in 55-gallon drums and removed from site by Safety-Kleen, approximately one drum in 90 days. These wastes are classified as F003 and F005 wastes (spent non-halogenated solvents). Ink producing process waste is stored in 55-gallon drums prior to removal from the site.

There 275-gallon aboveground storage tanks within a contained area are used to store waste oil. Three types of oil, synthetic, motor and hydraulic, are generated. Most of the oil is generated from various machinery and working equipment. Safety-Kleen waste cleaner, generated since 1986, is recycled. It is not known what was used prior to 1986. Both the waste oil and waste cleaner are manifested off site within 90 days.

One 12,000-gallon underground fuel oil tank is present on site. The tank is located near the gate to the facility and is monitored. A 550-gallon underground diesel tank is located near the well pumphouse.

Four underground mineral spirits storage tanks south of the main building were excavated in 1986. The size of the tanks were two 8,000-gallon, one 4,000-gallon and one 1,000-gallon. Soil samples collected in the area of the tanks indicated contamination with mineral spirits.

On September 24, 1981 a chemical explosion occurred at U.S. Bronze. The explosion was caused by aluminum powder which was being blown from a hopper truck into the aluminum atomization chamber and from there blown down to storage hoppers and packaging equipment in an adjacent building. A large black cloud rose from the plant and dispersed with the wind. Following the explosion, small scattered piles of burning aluminum particles were observed. The explosion was the result of static electricity. No environmental hazards were believed to have occurred due to the explosion.

A member of the Cancer and Toxic Substances Survey group reported that on October 8, 1981 a hose was observed coming from the ball mill area of the facility and discharging what appeared to be wastewater across the parking lot and into a storm drain. The discharge contained bronze and copper flakes which were present in the ditch and in Mill Creek where the storm drain flowed. An employee stated that the discharge occurred frequently and was the result of overfilling the ball mill recirculating tank. The plant engineer, however, stated that the discharge was infrequent. The company was directed to cease this method of discharging wastewater.

On May 31, 1984 the NJDEP, Division of Hazardous Waste Management (DHWM), Bureau of Central Enforcement (BCE) conducted an inspection at U.S. Bronze. Aluminum scrap was observed in 55-gallon drums around the property. This scrap was regularly sent to Kansas City Recycling which turned it into aluminum ingot. Also observed were twenty-three 55-gallon drums containing waste oil. The drums were not labeled and were of poor integrity. During the inspection, approximately 1,000 gallons of corrosive waste, 1,000 gallons of plating solutions and 2,200 gallons of waste oil were identified on site.

An investigation conducted on March 31, 1987 by the NJDEP, Division of Water Resources (DWR) revealed that the flooring beneath the electrolytic copper operation (known as Fernlock) had been eaten away to a depth of 1.5 feet by copper sulfate in the area of the sump pumps. This allowed the discharge to groundwater of copper sulfate solution. The area was noted by blue staining. The company agreed to conduct a cleanup of the area. (Attachment AA)

On June 2, 1989 the NJDEP, DHWM, Bureau of Northern Enforcement (BNE) noted a cleanup of the copper sulfate vat area was being conducted. However, eight 55-gallon drums containing the laboratory solvent mixture from the development of the ink production process were not properly managed. The mixture was a trichloroethylene (TCE)/toluene/acetone/hexane mixture. The company agreed to comply with the requirements for storing hazardous wastes.

On September 20, 1991 the NJDEPE, Division of Responsible Party Site Remediation (DRPSR), Bureau of Site Assessment (BSA) conducted a Pre-Sampling Assessment (PSA) at the U.S. Bronze facility. Runoff from the site and the roof drains appeared to flow downhill to an unnamed creek located on the east side and adjacent to the site. Pathways down the hill were evident and some areas were unvegetated. Copper- colored water was present outside the east side of the building. This area has been sampled and remedial activities have been proposed. (See Soil section.) Numerous readings above background were observed on the Organic

Vapor Analyzer (OVA) and HNu photoionization detector in the former mineral spirits tank area and the former gasoline tank area.

GROUNDWATER ROUTE

U.S. Bronze is underlain by 1 to 5 feet of surficial deposits consisting of red to brown silty clay with sand. Beneath these deposits is the Triassic age Brunswick Shale. The shale is a red argillaceous shale with local beds of fine-grained red sandstone, siltstone and black, gray or greenish shale. The Brunswick Shale is estimated to be 6,000 to 9,000 feet thick and is highly fractured. Groundwater is 50 to 100 feet deep and wells in the area of the site draw from this formation. Groundwater flow direction is not known, however, the facility is on a hill which may cause groundwater to flow radially away from the site.

U.S. Bronze operates two production wells, both 500 feet deep, on site. Trace levels of copper were detected in the wells in 1988. These wells are still used for the facility's industrial and potable water supply.

Four monitoring wells were installed on site in July 1989. MW-1 is 115 feet deep and located 10 feet west of the northwest corner of the manufacturing building. In the center of the alcove on the south side of the machine shop is MW-2 which is 60 feet deep. MW-3, 65 feet deep, is 33 feet east and 7 feet south of the southwest corner of the manufacturing building. MW-4, which is 8 feet west and 17 feet south of the southeast corner of the manufacturing building, is 75 feet deep. On August 4, 1989 Recon Systems of Three Bridges, New Jersey collected samples from each of the monitoring wells. The samples were analyzed for petroleum hydrocarbons (PHCs), priority pollutant metals (PPMs), volatile organic compounds (VOCs) and base/neutral compounds (BNs). No concentrations above NJDEP action levels were detected in MW-1 and MW-4. No PPMs were detected in MW-2 and MW-3. MW-2 exhibited elevated levels of PHCs (43.8 parts per million [ppm]), VOCs (1.83 ppm) and BNs (0.647 ppm). Elevated levels of VOCs (0.019 ppm) and BNs (0.083 ppm) were detected in MW-3.

The monitoring wells were sampled a second time by Recon Systems on December 13, 1989. Samples were analyzed for PHCs, VOCs and BNs. No contaminants were detected in MW-1 and MW-4. MW-2 exhibited 1,1-dichloroethane at 0.019 ppm. In MW-3, 1,1-dichloroethane (0.20 ppm), 1,1-dichloroethylene (0.27 ppm), ethylbenzene (0.057 ppm), 1,1,1-trichloroethane (0.19 ppm), m-xylene (0.11 ppm), p,o-xylene (0.053 ppm), bis (2-ethylhexyl) phthalate (0.014 ppm) and naphthalene (0.11 ppm) were detected. It was proposed that a recovery pump be installed in MW-3 to recover groundwater. The recovery pump has not yet been installed.

The Flemington Water Department operates four wells within 4 miles of the site. Two wells are 0.8 mile from the site, one well is 1.2 miles and the fourth well is 1.9 miles from the site. The wells are 350 to 510 feet deep and are screened in the Brunswick Formation. Approximately 4,240 residents are served by these wells in Flemington Borough and Raritan Township.

Residents in Raritan Township, Readington Township, Delaware Township, East Amwell Township and Hillsborough Township within 4 miles of the site are served by private wells. The nearest well is approximately 400 feet east of the site. Approximately 19,100 residents have private wells within 4 miles. The Hunterdon Medical Center operates four wells 2 miles from the site which serve approximately 600 patients and staff.

SURFACE WATER ROUTE

U.S. Bronze maintains NJPDES Permit No. 003336 to discharge oil/water separator effluent and stormwater runoff to Mill Creek. Until June 1991 water softener regeneration wastes and noncontact cooling water blowdown were also permitted to be discharged to Mill Creek. Currently they are being discharged to the Raritan Township Municipal Utilities Authority (RTMUA). The company is in the process of developing a stormwater treatment system for the roof drains to discharge to Mill Creek.

Mill Creek flows north for 1 mile into Bushkill Brook. An unnamed stream adjacent to the site also flows for approximately 1 mile to Bushkill Brook. Bushkill Brook flows for 0.4 mile into the Red Rock Lake section of the South Branch Raritan River. The South Branch Raritan River meets with the North Branch Raritan River to form the Raritan River approximately 12.9 miles downstream from the site. There are no drinking water intakes within 15 stream miles of the site. Mill Creek and Bushkill Brook may be used for fishing purposes. The South Branch Raritan River and Raritan River are used for fishing, boating and swimming purposes.

During a Compliance Monitoring Inspection conducted by the NJDEP, Division of Water Resources (DWR) on May 21, 1981, U.S. Bronze received an "unacceptable" rating. The rating was due to the oil/water separator and metal recovery unit being considered an industrial wastewater treatment facility. The oil/water separator separates particles of metal powders from the cooling water discharge. Also noted during the inspection were many containers, barrels and drums of various types stored in the rear and loading dock area of the facility.

An "unacceptable" rating was given to U.S. Bronze following a November 10, 1987 Compliance Evaluation Inspection (CEI) conducted by the NJDEP, DWR, BNE. The oil/water separator was providing inadequate treatment and the final effluent was blue-gray and turbid. U.S. Bronze had exceeded their permit discharge limits for petroleum hydrocarbons (15 ppm) at 37 ppm and copper (1 ppm) at 2.2 ppm. During the inspection it was observed that the operation of the copper sulfate processing area had ceased and the cemented troughs were empty and deteriorated. The deterioration resulted in the discharge of copper sulfate to groundwater. The company was directed to correct the violations. (Attachment O)

Stream and sediment samples were collected upstream and downstream in the unnamed stream adjacent to the site on March 28, 1988 by Recon Systems of Three Bridges, New Jersey. The samples were analyzed for copper and sulfate. Copper was not detected in the water samples. Copper was detected in the upstream sediment at 26.1 ppm and in the downstream sediment at 95.4 ppm. There was not a significant difference in sulfate concentrations between the upstream and downstream samples.

On May 4, 1989 wastewater samples were collected from the U.S. Bronze wastewater treatment plant by the NJDEP, DWR, BNE. The samples were analyzed for PHCs, chromium, copper and zinc. Copper was detected at 148 ppb and zinc at 119 ppb.

The NJDEP, DWR, BNE conducted a CEI of U.S. Bronze on May 30, 1989 and issued them an "unacceptable" rating. During the inspection, material from a hazardous waste spill containment tank was observed being pumped and discharged to an adjacent unpaved area. The company was directed to cease the discharge until an appropriate NJPDES permit was obtained. U.S. Bronze was also cited for exceeding their permit limits for copper (1,000 ppm) and zinc (1,000 ppm) on two occasions. In late 1988 copper was found at 4,200 ppm and zinc at 4,000 ppm; and in early 1989 copper was detected at 1,600 ppm and zinc at 2,300 ppm. U.S. Bronze was directed to institute measures to correct the violations.

On May 11, 1990 Recon Systems collected an upstream and downstream surface water sample in the unnamed stream. The samples, which were analyzed for copper and sulfate, did not indicate a significant difference between the two samples.

The NJDEP, DWR, BNE collected an industrial effluent sample from U.S. Bronze on June 20, 1990. The sample was analyzed for PHCs, chromium, copper and zinc. Copper was detected at 201 ppb and zinc at 156 ppb.

Following a CEI conducted on March 27, 1991 by the NJDEP, DWR, BNE, U.S. Bronze received an "unacceptable" rating for exceeding their permit limits for copper and zinc from February 1, 1990 to January 31, 1991. The permit limit for copper was 14 ppb and zinc was 97 ppb. Reported results are summarized below:

Monitoring Period	Copper (ppb)	Zinc (ppb)
May 1990	450	270
June 1990	220	170
July 1990	120	No data
August 1990	180	110
September 1990	430	160
October 1990	310	140
November 1990	420	190
December 1990	240	340
January 1991	170	110
February 1991	180	110

U.S. Bronze was directed to correct their violations.

The NJDEP, DWR, BNE collected a grab sample on April 23, 1991 from U.S. Bronze. The samples were analyzed for PHCs, chromium, copper and zinc. Copper, at 247 ppb, and zinc, at 135 ppb, were detected.

There are no wetlands along Mill Creek or Bushkill Brook. Several wetland types are present along the South Branch Raritan River. The most predominant types are riverine lower perennial open water, palustrine open water, palustrine forested broad-leaved deciduous and palustrine emergent.

State threatened species in the area of the site or along the surface water pathway include the longtail salamander, the American bittern, the upland sandpiper, the bobolink, the grasshopper sparrow, the vesper sparrow and the cliff swallow.

AIR ROUTE

U.S. Bronze holds 33 Air Pollution Certificates through the NJDEPE, Division of Environmental Quality under Plant ID #80030. The certificates are primarily for the ball mill area. Other equipment and operations permitted include furnaces, bronze atomization, ribbon blenders, burning operation, boiler, washer tank and stacks.

A potential for air contamination exists due to operations conducted and materials handled on site.

SOIL

U.S. Bronze is located on the Penn shaly silt loam (PeC2) with 6 to 12 percent slopes. The Penn series consists of moderately deep, gently sloping to moderately steep, well-drained, loamy soil. PeC2 soil is shallower to shale bedrock than other members of the series.

In January 1988 Recon Systems of Three Bridges, New Jersey collected 14 soil samples at U.S. Bronze. The samples were analyzed for pH, copper and sulfate. I-1, I-2 and B-1 were collected from the deteriorated concrete floor area. B-2, B-4, B-5 and B-6 were collected in an area of blue staining. B-3 was located near a hole in the east wall of the electrolysis room. Results of this sampling episode are discussed below:

Boring No.	Depth (inches)	pH	Copper (ppm)	Sulfate (ppm)
I-2	6-12	7.41	148	66
I-1	6-12	2.99	2,070	9,460
I-1	12-18	2.38	2,200	11,780
B-1A	6-12	7.09	97.1	81.1
B-1B	40-48	4.84	644	72.6
B-2A	6-12	4.98	3,010	834
B-2B	40-48	6.24	129	143
B-3A	6-12	6.70	28.8	9.5
B-3B	36-42	7.23	18	12.1
B-4A	6-12	4.26	1,240	197
B-4B	36-42	6.17	973	273
B-5A	6-12	4.42	1,590	87.3
B-5B	24-30	4.29	1,450	ND
B-6A	6-12	5.63	493	46.2

ND = not detected

Recon Systems collected three soil samples in February 1988 at a depth of 0 to 6 inches. S-1 was collected along the same trend as B-2, B-4, B-5 and B-6 above. S-2 and S-3 were collected near the large dust collectors. The samples were analyzed for pH, copper and sulfate. Sulfate was only detected in S-1 at 10 ppm. Copper concentrations were 1,190 ppm in S-1, 75,900 ppm in S-2 and 18,800 ppm in S-3. Levels of pH ranged from 5.14 to 6.86.

A lime slurry injection trench system was constructed on site to reduce the mobility of copper. On July 11 and 12, 1989 Recon Systems dug a trench 5 feet wide, 60 feet long and 4 feet deep, beneath the floor of the Fernlock Building. The bottom of the trench was lined with two layers of plastic and then a 4-inch perforated PVC pipe was laid in the trench. Stand pipes were placed at each end of the trench to act as fill and vent lines. The trench was filled with 1 foot of crushed stone with a layer of plastic sheeting and geofabric covering it. Excavated soil was then graded over the trench leaving only the two stand pipes visible. Approximately 1,000 pounds of lime was added to this area. Outside the Fernlock Building a 2.5- to 3-foot trench was constructed in an oval around the perimeter of the area. Approximately 800 pounds of lime was added to this area before it was regraded. Down slope of the Fernlock Building three trenches, 2 feet wide by 50 feet long, were constructed. Depths of the trenches varied from 2.5 feet near the top of the hill to 1 foot near the collection trench. A total of 600 pounds of lime were slurried then pumped to the trenches. Below the last injection trench a crescent-shaped collection trench was constructed to contain any overfilling of the trenches. The trench was filled with stone.

Based on a soil gas survey, soil sampling was conducted on March 28, 1990 by Recon Systems. The samples, which were analyzed for mineral spirits, were collected from eight locations in the area of the former underground storage tanks at various depths. Sampling results are discussed below:

Sample No.	Depth (feet)	Concentration (ppm)
S1/1	3-3.5	ND
S1/2	5.5-6	ND
S2/1	3-3.5	ND
S2/2	6-6.5	0.8
S3/1	3-3.5	5.7
S4/1	3-3.5	56.0
S4/2	4.5-5	29.0
S4/3	8.5-9	210.0
S5/1	3-3.5	11.0
S6/1	0.5-1	ND
S7/1	3-3.5	60.0
S7/2	5.9-6.4	ND
S8/1	3-3.5	ND
S8/2	4-4.5	ND

ND = not detected

Recon Systems recommended a cleanup level of 250 ppm due to the fact that the tanks had been removed and mineral spirits is closely related to petroleum hydrocarbons.

On September 5 and November 13, 1990 Dan Raviv Associates of Millburn, New Jersey collected 65 soil and 3 sediment samples throughout the site. The samples were analyzed for copper. The results are presented in Table I.

Copper concentrations ranged from 12 to 14,000 ppm. Elevated concentrations were located near the adjacent farmhouse, as far as 450 feet northeast of the collection and injection trenches. It is believed that these concentrations are due to the prevailing wind at the site.

DIRECT CONTACT

No incidents of direct contact with hazardous substances on site have been reported. A potential for direct contact by workers exists as hazardous materials are used on site. The manufacturing area of the site is fenced preventing access by the off-site population. Also, residents at the nearby farmhouse may contact copper-contaminated soil which was discovered on their property.

FIRE AND EXPLOSION

As previously discussed, a chemical explosion occurred at U.S. Bronze in September 1981. No environmental hazards were known to have occurred as a result of the explosion.

No additional incidents have been reported. There is a potential for fire or explosion due to operations conducted on site.

ADDITIONAL CONSIDERATIONS

Several areas lacking vegetation were noted on site and on the down slope from the facility during the PSA conducted on September 20, 1991 by the NJDEPE, DRPSR, BSA. A potential for damage to fauna and contamination of the food chain are present due to contaminants detected on site.

Copper was detected on the property and farm fields adjacent to U.S. Bronze in November 1990.

ENFORCEMENT ACTIONS

A Notice of Violation (NOV) was issued to U.S. Bronze by the NJDEP, DWR, BNE on March 31, 1987. U.S. Bronze was cited for an unpermitted discharge to groundwater from the drainage system in the electrolytic process area (Fernlock); discharging metal flake from the floor drains in the ball mill area to their surface water discharge; and for not monitoring the flow from the surface water discharge. The company was required to immediately correct the violations.

On November 3, 1989 the NJDEP, DWR, BNE issued an Administrative Order and Notice of Civil Administrative Penalty Assessment (AO/NCAPA) to U.S. Bronze. The BNE found that from August 1987 through April 1989 U.S. Bronze violated the discharge limits of their NJPDES/Discharge to Surface Water permit. Parameters exceeded were copper, zinc, pH, petroleum hydrocarbons and chemical oxygen demand (COD). U.S. Bronze was ordered to conform to their permit and assessed a penalty of $255,000. Following the issuance of the AO/NCAPA, U.S. Bronze requested an administrative hearing.

A second AO/NCAPA was issued to U.S. Bronze on May 7, 1990 by the NJDEP, DWR, BNE. The findings were the same as the previous AO/NCAPA; the penalty assessment for this order was $194,500. U.S. Bronze again requested an administrative hearing. Currently the site is in litigation and awaiting the hearing.

PRIORITY DESIGNATION

U.S. Bronze is designated a high environmental concern. Copper and mineral spirits have been detected in on-site soils. Low levels of volatile organic compounds have been detected in the on-site monitoring wells. Also, copper was detected in soils near the adjacent farmhouse. There is a potential for the neighboring farmhouse well to become contaminated.

RECOMMENDATIONS

Soil sampling is recommended in the area of the former mineral spirits and gasoline underground storage tanks. The on-site production wells and, due to the unknown direction of groundwater flow, the potable well at the adjacent farmhouse should be sampled.

Submitted by:

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HSMS II
Bureau of Site Assessment
September 30, 1991